ARM Nauru Research Station
Site Visit 0308N Report

Visit Duration: 14 August to 21 August 2003

Denig District, Republic of Nauru

CONTENTS

Introduction

The main goals of the TWP Operations Site Visit 0308-N Visit to ARCS-2 at Nauru were the following: 1) Install MMCR antenna 2) Install new UPS batteries 3) Replace SMET anemometers.

This report is organized according to the planned tasks or work units performed during the Site Visit. Within these work units the activities accomplished are arranged chronologically. Most of the information was put together by the Site Visit Team members based on the actual visit, daily reports.

A. TWP Operations Management and Site Visits

Site Visits are scheduled on approximately four-month intervals and are focused mainly on routine maintenance, instrument calibration, instrument replacement, and training. Sometimes non-routine visits are needed for technical tasks such as emergency repairs, retrofits, and/or the addition of new instruments. A formal audit-out is performed before departure.

The work on the Site Visit is performed by the Site Visit team, but often in close coordination with the local on-site Observers. The team holds a daily, morning tasking meeting at the site using the proposed Site Visit tasking schedule. After each day's work, the team meets to summarize work activities and an assigned team member writes a "Daily Report" and e-mails the report to TWP personnel in the U.S. Because of time-zone differences, necessary calls to instrument mentors in the U.S. are done in the morning.

Site Visit Members

- Rex Pearson

B. Tasks Performed - Nauru

1. MMCR – install antenna

14 Aug:

MMCR antenna at site – organized crane for tomorrow morning to lift antenna into place

15 Aug:

Crane not available until tomorrow (Saturday)

16 Aug:

Crane arrived and antenna lifted onto the roof of the I Van.

All the mounting holes are different; this has required re-drilling the holes in the mounting bars.

17 Aug:

Continued mounting the antenna on the roof of I Van and connecting the waveguide to inside of the van.

18 Aug:

Restoring waveguides, components etc inside I van and connecting to MMCR.

Initial testing commenced. Reflections being seen from radar but having a problem with the data transfer. Have sent Kevin Widener an email.

19 Aug:

Had clouds appear today at about 12Km high by the MPL. Unable to see them on the MMCR so suspect I have a receiver problem.

Was able to do a data collection today albeit with some problems – have sent Dick Eagan an e-mail asking for information on the ftp server on the Solaris computer

20 Aug:

Dick Eagan checked permissions on MMCR buffer computer (Solaris) and corrected a problem – this has allowed transfers to the SDS to occur correctly. (Thanks Dick and Ron)

Receiver problem turned out to be associated with the preamplifier – it was switched off – turning it on has corrected the problem and the radar is now seeing good returns. (Thanks Ken)

Completed aligning the antenna and mounting the air feed system.

Some monitored parameters are not reporting correctly – this is associated with a (most likely) faulty mux – this does not affect the radar operation is just part of the monitoring system.

21 Aug:

Checking errors in monitoring system. The pow files are not being transferred from the /health directory to the /sds/outgoing directory, this is stopping the transmitter power indication from working. E-mailed Ken Moran to see if he has any ideas.

The circulator temperatures are not reading correctly, checking the interface units and also e-mailed Ken on this issue to see if he has any ideas.

Brian Ermold has confirmed the data files are arriving correctly.

22 Aug:

Received a reply from Tom Ayres re the pow files. Have confirmed that the cron job doesn't appear to be running a task to transfer the files and there appears to be a problem in the MoveToSds script that cron is supposed to run. Have discussed with Kevin and will be resolved.

2. UPS - install batteries

14 Aug:

Batteries unpacked ready for installation

15 Aug:

I Van Clary UPS batteries replaced instruments restored to service 0025z

D Van Clary UPS batteries replaced, UPS off line at 0245z and restored at 0420z

3. GRNRD IRT – troubleshoot data problem
   14 Aug:

   Inspected IRT for potential problems.

   On the inside of the lens is a “crystalline growth” covering about 30% of the lens area. This growth is between the lenses and cannot be cleaned.

   A replacement IRT will be required.

4. DS – DRAC Card installation
   15 Aug:

   1900z SDS was turned off and replacement DRAC cards installed into NFS and collector.

   System was restored by 2000z.

   DRAC cards tested and functioned correctly, remote access is now available.

   The BIOS batteries were also checked to see if they were at the correct voltage – they were. It appears the initial fault may have been due to faulty batteries.

5. Calibration – confirm Cal Kit is complete for upcoming Cal visit
   18 Aug:

   Cal kit has enough components for the calibration. The cal logger is being sent from Darwin together with the set of leads we ‘normally” use.

6. SMET - replace both anemometers
   14 Aug:

   Anemometers replaced, system out of service 0300z till 0410z

   Change sheets placed on FTP site under /resets/SV0308N

   Changed anemometer Config – Bill Porch advised details.

   Copy of Config on twppo ftp site

   High or Wind 1 is now: Anemometer 49705 and Vane is 76843.

   Low or Wind 2 is now: Anemometer 18424 and Vane is 72578.

7. VSAT – if possible, test and set up voice over IP
   15 Aug:

   Completed some testing on the VoIP circuit. If SGP calls the Nauru, there is no ring on the Nauru phone but the call can be answered by lifting the handset and dialing 9 (provided you know the call is coming).

For an outbound call I can dial 9 and get an outside line but cannot progress from that point.

Dick Eagan is setting up a node at ANL so we can test further tomorrow.

17 Aug:

Changes made by Dick Eagan in the programming has allowed an outbound call to be made within the US. Further tests to be done to check the inbound calling to Nauru.

19 Aug:

Inbound dialing checked and functioning, the VoIP system is now fully functional in the E Van.

8. Cal stand – coordinate moving Cal stand from NIES to ARCS-2

9. AERI – inspect, clean, repair rain sensor, mirror

15 Aug:

Checked operation of the AERI hatch – all normal – hatch is fully opening and closing on water being applied to the sensor.

Checking further into the control from the hatch to the AERI

21 Aug:

Checking on hatch indications – new indicator lamps are required. (Newark Electronics - 96F6580)

Hatch controller is not giving the correct indications to the AERI computer. Fault traced to faulty 74LS14 gate and NEC2501

opto-coupler. Was able to bypass the faulty gate with a wire jumper under the PCB and I substituted a PC713 opto-coupler (6pin v/s 4pin) in lieu of the faulty one. This is only a temporary fix.

Looking at the circuit there does not appear to be any current limiting (resistor) between the opto-coupler and the 74LS14; this may explain the failure of the two units.

I have put in a 470 ohm resistor in the temporary configuration for both of the opto's. This was easily done by removing the jumper links and soldering a resistor onto the IC pins.

I will need a replacement PS2501-1 opto-coupler to replace the faulty one and I can source the 74LS14 in Australia.

(Looking at the PS2501 data sheet there does not appear to be any internal current limiting in the package and the 74LS14 is rated for 8mA average output sink current.)

22 Aug:

Run observers thru cleaning the inner water sensor on the Aeri and showed them how to monitor the resistance so they could determine if it had been cleaned correctly. Jack confirmed he was happy with the Aeri functions after the cleaning.

10. Inspect New A/C systems

14 Aug:

Top indoor unit in D Van has a noisy fan – sounds like it is rubbing on something inside the unit.

The 2 indoor units in I Van are positioned behind the MMCR rack. Access is difficult but not impossible. Will evaluate further as the MMCR repair progresses.

The installation in the AERI Van has no apparent problems

11. Check EMWIN UPS

14 Aug:

During a power changeover I noticed the EMWin system failed due to the UPS batteries not holding up. The EMWin system has its own UPS.

I replaced the battery with a spare on site and connected the observer's laptops to the UPS as well. Their laptops were dropping out on every power changeover due to faulty batteries in their laptops, this solved the problem. UPS is an APC Brand, Model BP420S, Sno N80030260134 fed by non UPS 120 VAC.

12. Plumb new water tank to wash basin and toilet

18 Aug:

Commenced changing the plumbing to the wash basin and toilet to allow water from the tank to be used.

19 Aug:

Completed plumbing work – toilets and wash basin at toilets is now connected to the tank water supply – also connected the electrolyser tank to the system to ensure it stays full.

13. Install changeover sat phone – programmed to prevent dialing unauthorized numbers

19 Aug:

Sat phone changed out and fully tested – only numbers in the phonebook can be dialed.

C. Items needed for future:

2 Spare Anemometers

Fix noisy AC fan on D-van Top Indoor Component

Replacement GNDRAD IRT

Spare pump for the electrolyser (Davy XP350H) – the old one was “taken” a few nights ago by someone who thought they needed it more than the site did.

Spare indicator lamps for the Aeri hatch controller (same also required for Darwin). (Newark Electronics - 96F6580)

D. Items to be returned to SGP:

Anemometers removed on 14Aug03: S/N’s 31103/58318 and 18422/44693

Prep

1. Ship additional anemometers to Nauru
   Completed